Answer the questions in the space provided below. You may use the back of the page if you need more space. Time: 15 minutes.

Name and section: _____

1. Let $R \subseteq \mathbb{R} \times \mathbb{R}$ be a relation on the real numbers, given by:

$$R = \{(x, y) \mid sin(x) = sin(y)\}$$

where $sin : \mathbb{R} \to \mathbb{R}$ is the usual sine trigonometric function.

(a) Prove that the relation R is reflexive. (20)

(b) Prove that the relation R is symmetric. (40)

(c) Prove that the relation R is transitive. (40)